IT IS CLAIMED

1. An optical switch testing system (OSTS) for testing a device under test (DUT), the DUT including a plurality of DUT optical input ports and a plurality of DUT optical output ports, the system comprising:

at least one processor;

memory;

a plurality of OSTS output ports, wherein a selected plurality of the OSTS output ports are each optically connected to a respective DUT input port;

a plurality of OSTS input ports, wherein a selected plurality of the OSTS input ports are each optically connected to a respective DUT output port;

an optical test stimulation component configured or designed to generate optical test signals to be transmitted to a selected plurality input ports of the DUT; and

an optical test detection component configured or designed to detect a presence or absence of light on a selected plurality output ports of the DUT.

2. The system of claim 1 wherein the DUT includes a photonic optical cross-connect device.

3. The system of claim 1 wherein the optical test stimulation component is further configured or designed to generate optical test signals to be transmitted to a selected plurality input ports of the DUT at substantially a same time;

and wherein the optical test detection component is further configured or designed to detect a presence or absence of light on a selected plurality output ports of the DUT at substantially a same time.

4. The system of claim 1 further comprising:

a first OSTS output port optically connected to a first DUT input port;

a second OSTS output port optically connected to a second DUT input port;

a first OSTS input port optically connected to a first DUT output port; and

a second OSTS input port optically connected to a second DUT output port.

5. The system of claim 1 wherein the optical test stimulation component includes:

at least one light source; and

at least one modulator circuit configured or designed cause a modulated light signal to be transmitted at a specific time to at least one designated DUT input port.

6. The system of claim 5 wherein the at least one modulator circuit includes a separate modulator circuit for each active input port associated with the DUT.

7. The system of claim 5 wherein the at least one light source includes at least two lasers configured or designed to produce light at different frequencies.

8. The system of claim 1 wherein the optical test detection component includes:

a plurality of photo detectors; and

a plurality of demodulator circuits configured or designed measure properties associated with light detected at a plurality of selected DUT output ports.

9. The system of claim 8 wherein said properties include:

power levels of light detected at selected ports of the DUT; and

time values corresponding to instances when specific optical signals were detected at selected DUT output ports.

10. The system of claim 8 wherein the plurality of photo detectors includes a separate photo detector for each active output port associated with the DUT.

11. The system of claim 8 wherein the plurality of demodulator circuits includes at least 8 separate demodulator circuits.

12. The system of claim 1 further comprising a SONET traffic analyzer.

13. The system of claim 1 further comprising a Gigabit Ethernet traffic analyzer.

14. The system of claim 1 further comprising a polarization scambler configured or designed to scramble or randomize a state of polarization of test optical signals generated by the OSTS.

15. The system of claim 1 further comprising at least one power meter for measuring a power level of light.

16. A method for performing testing of an optical device under test (DUT), the DUT including a plurality of DUT optical input ports and a plurality of DUT optical output ports, the testing being performed by an optical switching testing system (OSTS), the OSTS including a plurality of OSTS output ports optically connected to a plurality of DUT input ports, the OSTS further including a plurality of OSTS input ports optically connected to a plurality of DUT output ports, the method comprising:

configuring components of the OSTS in order to perform a specific test on the DUT;

configuring a first test scenario at the DUT;

transmitting at least one optical test signal to at least one DUT input port;

obtaining test results by monitoring at least one DUT output port for the presence or absence of light; and

analyzing the test results for specific characteristics.

17. The method of claim 16 further comprising:

automatically reconfiguring the DUT for a second test scenario;

automatically implementing the specific test on the DUT; and

obtaining test results associated with the second test scenario from the DUT.

18. The method of claim 16 further comprising automatically transmitting a plurality of optical test signals to a plurality of DUT input ports during the first test scenario.

19. The method of claim 18 wherein the plurality of optical test signals are transmitted at substantially a same time to the DUT input ports.

20. The method of claim 16 further comprising automatically monitoring a plurality of DUT output ports for test results during the first test scenario.

21. The method of claim 20 wherein the plurality of DUT output ports are monitored at substantially a same time for test results.

22. The method of claim 16 further comprising performing static optical cross-talk testing on the DUT, wherein the static optical cross-talk testing includes automatically performing a plurality of separate static optical cross-talk testing operations on a selected plurality of different optical paths associated with the DUT.

23. The method of claim 16 further comprising performing transitional optical cross-talk testing on the DUT, wherein the transitional optical cross-talk testing includes automatically performing a plurality of separate transitional optical cross-talk testing operations on a selected plurality of different optical paths associated with the DUT.

24. The method of claim 16 further comprising performing optical path stability testing on the DUT, wherein the optical path stability testing includes automatically performing a plurality of separate optical path stability testing operations on a selected plurality of different optical paths associated with the DUT.

25. The method of claim 16 further comprising performing data integrity testing on the DUT, wherein the data integrity testing includes automatically performing a plurality of separate data integrity testing operations on a selected plurality of different optical paths associated with the DUT.

26. The method of claim 16 further comprising performing insertion loss testing on the DUT, wherein the insertion loss testing includes automatically performing a plurality of separate insertion loss testing operations on a selected plurality of different optical paths associated with the DUT.

27. The method of claim 16 further comprising performing path switching time testing on the DUT, wherein the path switching time testing includes automatically performing a plurality of separate path switching time testing operations on a selected plurality of different optical paths associated with the DUT.

28. The method of claim 16 further comprising performing path verification testing on the DUT, wherein the path verification testing includes automatically performing a plurality of separate path verification testing operations on a selected plurality of different optical paths associated with the DUT.

29. An optical switch testing system (OSTS) for testing a device under test (DUT), the DUT including a plurality of DUT optical input ports and a plurality of DUT optical output ports, the system comprising:

at least one processor;

memory;

a plurality of OSTS output ports, wherein a selected plurality of the OSTS output ports are each optically connected to a respective DUT input port;

a plurality of OSTS input ports, wherein a selected plurality of the OSTS input ports are each optically connected to a respective DUT output port;

an optical test stimulation component configured or designed to generate optical test signals to be transmitted to a selected plurality input ports of the DUT; and

an optical test detection component configured or designed to detect a presence or absence of light on a selected plurality output ports of the DUT;

the system being configured or designed to configure components of the OSTS in order to perform a specific test on the DUT;

the system being further configured or designed to configure a first test scenario at the DUT;

the system being further configured or designed to transmit at least one optical test signal to at least one DUT input port;

the system being further configured or designed to obtain test results by monitor at least one DUT output port for the presence or absence of light; and

the system being further configured or designed to analyze the test results for specific characteristics.

30. The system of claim 29 being further configured or designed to automatically reconfigure the DUT for a second test scenario;

the system being further configured or designed to automatically implementing the specific test on the DUT; and

the system being further configured or designed to obtain test results associated with the second test scenario from the DUT.

31. The system of claim 29 being further configured or designed to automatically transmit a plurality of optical test signals to a plurality of DUT input ports during the first test scenario.

32. The system of claim 31 wherein the plurality of optical test signals are transmitted at substantially a same time to the DUT input ports.

33. The system of claim 29 being further configured or designed to automatically monitor a plurality of DUT output ports for test results during the first test scenario.

34. The system of claim 33 wherein the plurality of DUT output ports are monitored at substantially a same time for test results.

35. The system of claim 29 being further configured or designed to automatically perform a plurality of separate static optical cross-talk testing operations on a selected plurality of different optical paths associated with the DUT.

36. The system of claim 29 being further configured or designed to automatically perform a plurality of separate transitional optical cross-talk testing operations on a selected plurality of different optical paths associated with the DUT.

37. The system of claim 29 being further configured or designed to automatically perform a plurality of separate optical path stability testing operations on a selected plurality of different optical paths associated with the DUT.

38. The system of claim 29 being further configured or designed to automatically perform a plurality of separate data integrity testing operations on a selected plurality of different optical paths associated with the DUT.

39. The system of claim 29 being further configured or designed to automatically perform a plurality of separate insertion loss testing operations on a selected plurality of different optical paths associated with the DUT.

40. The system of claim 29 being further configured or designed to automatically perform a plurality of separate path switching time testing operations on a selected plurality of different optical paths associated with the DUT.

41. The system of claim 29 being further configured or designed to automatically perform a plurality of separate path verification testing operations on a selected plurality of different optical paths associated with the DUT.

42. An optical switch testing system (OSTS) for testing a device under test (DUT), the DUT including a plurality of DUT optical input ports and a plurality of DUT optical output ports, the system comprising:

at least one processor;

memory;

a plurality of OSTS output ports, wherein a selected plurality of the OSTS output ports are each optically connected to a respective DUT input port;

a plurality of OSTS input ports, wherein a selected plurality of the OSTS input ports are each optically connected to a respective DUT output port;

an optical test stimulation component configured or designed to generate optical test signals to be transmitted to a selected plurality input ports of the DUT;

an optical test detection component configured or designed to detect a presence or absence of light on a selected plurality output ports of the DUT;

means for configuring components of the OSTS in order to perform a specific test on the DUT;

means for configuring a first test scenario at the DUT;

means for transmitting at least one optical test signal to at least one DUT input port;

means for obtaining test results by monitoring at least one DUT output port for the presence or absence of light; and

means for analyzing the test results for specific characteristics.

43. The system of claim 42 further comprising:

means for automatically reconfiguring the DUT for a second test scenario;

means for automatically implementing the specific test on the DUT; and

means for obtaining test results associated with the second test scenario from the DUT.

44. The system of claim 42 further comprising means for automatically transmitting a plurality of optical test signals to a plurality of DUT input ports during the first test scenario.

45. The system of claim 44 wherein the plurality of optical test signals are transmitted at substantially a same time to the DUT input ports.

46. The system of claim 42 further comprising means for automatically monitoring a plurality of DUT output ports for test results during the first test scenario.

47. The system of claim 46 wherein the plurality of DUT output ports are monitored at substantially a same time for test results.